



SEQUENCE LISTING

<110> PINTER, JONATHAN
KURIHARA, TAKAO
SLEPTSOVA, IRINA
BRUENING, ERIC EGON
ZIEHLER, WILLIAM
MAKAROV, VLADIMIR L.

<120> IN VITRO DNA IMMORTALIZATION AND WHOLE GENOME
AMPLIFICATION USING LIBRARIES GENERATED FROM RANDOMLY
FRAGMENTED DNA

<130> RUBC:021US

<140> UNKNOWN

<141> 2004-03-08

<150> 60/453,071

<151> 2004-03-08

<160> 145

<170> PatentIn Ver. 2.1

<210> 1

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 1
gagtagaatt ctaatatcta 20

<210> 2

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 2
gagatattag aattctactc 20

<210> 3

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 3

agtgggattc cgcattgctag t

21

<210> 4

<211> 12

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 4

taactagcat gc

12

<210> 5

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<220>

<221> modified_base

<222> (14)..(17)

<223> N = A, C, G OR T/U

<400> 5

ttgcggccgc attnnnnttc

20

<210> 6

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<220>

<221> modified_base

<222> (11)..(16)

<223> N = A, C, G OR T/U

<400> 6

ccgactcgac nnnnnnatgt gg

22

<210> 7

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (17)..(21)
<223> N = A, C, G OR T/U

<400> 7
tggtagtctt tgatcannnn n

21

<210> 8
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 8
agagttggta gctcttgatc

20

<210> 9
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (23)..(28)
<223> N = A, C, G OR T/U

<400> 9
gtaatacgac tcactatagg gcnnnnnnn

28

<210> 10
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 10
gtaatacgac tcactatagg gc

22

<210> 11
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 11
gtaatacgac tcactata

18

<210> 12
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (1)..(2)
<223> N = A, C, G OR T/U

<400> 12
nncctatagt gagt

14

<210> 13
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (1)..(3)
<223> N = A, C, G OR T/U

<400> 13
nnncctatag tgagt

15

<210> 14
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(8)
<223> N = A, C, G or T/U

<400> 14
gacnnnnngt c

11

<210> 15
<211> 12

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (1)..(12)
<223> N = A, C, G OR T/U

<400> 15
nacnnnngta cn

12

<210> 16
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(9)
<223> N = A, C, G OR T/U

<400> 16
cgannnnnnt gc

12

<210> 17
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(8)
<223> N = A, C, G OR T/U

<400> 17
gccnnnnngg c

11

<210> 18
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(7)
<223> N = A, C, G OR T/U

<400> 18
gatnnnnatc

10

<210> 19
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (3)..(9)
<223> N = A, C, G OR T/U

<400> 19
ccnnnnnnng g

11

<210> 20
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(8)
<223> N = A, C, G OR T/U

<400> 20
gcannnnntg c

11

<210> 21
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(9)
<223> N = A, C, G OR T/U

<400> 21
ccannnnnnt gg

12

<210> 22
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(9)
<223> N = A, C, G OR T/U

<400> 22
gacnnnnnng tc

12

<210> 23
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(8)
<223> N = A, C, G OR T/U

<400> 23
cctnnnnnag g

11

<210> 24
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (6)..(10)
<223> N = A, C, G OR T/U

<400> 24
gagtcnnnnn

10

<210> 25
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (3)
<223> Y = C OR T

<220>
<221> modified_base
<222> (4)..(7)
<223> N = A, C, G OR T/U

<220>
<221> modified_base
<222> (8)
<223> R = A OR G

<400> 25
caynnnnrtg

10

<210> 26
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (3)..(9)
<223> N = A, C, G OR T/U

<400> 26
gcnnnnnnng c

11

<210> 27
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(8)
<223> N = A, C, G OR T/U

<400> 27
ccannnnntg g

11

<210> 28
<211> 10

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(7)
<223> N = A, C, G OR T/U

<400> 28
gacnnnngtc

10

<210> 29
<211> 13
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (5)..(9)
<223> N = A, C, G OR T/U

<400> 29
ggccnnnnng gcc

13

<210> 30
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (4)..(12)
<223> N = A, C, G OR T/U

<400> 30
ccannnnnnn nntgg

15

<210> 31
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
 <221> modified_base
 <222> (4)..(7)
 <223> N = A, C, G OR T/U

 <400> 31
 gaannnnttc 10

 <210> 32
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 32
 gtaatacgac tcactatagg 20

 <210> 33
 <211> 13
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 33
 cctatagtgc agt 13

 <210> 34
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <220>
 <221> modified_base
 <222> (21)
 <223> N = A, C, G OR T/U

 <400> 34
 gtaatacgac tcactatagg n 21

 <210> 35
 <211> 14
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<220>
<221> modified_base
<222> (1)
<223> N = A, C, G OR T/U

<400> 35
ncctatagtg cagt

14

<210> 36
<211> 46
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 36
cctatagtga gtcgtattac ttttttgtaa tacgactcac tatagg

46

<210> 37
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 37
cctatagtga gtcgtattac

20

<210> 38
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 38
agtaatacga ctcactatag g

21

<210> 39
<211> 13
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (1)

<223> N = A, C, G OR T/U

<400> 39
ncctatagtg agt

13

<210> 40
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (22)..(23)
<223> N = A, C, G OR T/U

<400> 40
agtaatacga ctactatag gnn

23

<210> 41
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (22)
<223> N = A, C, G OR T/U

<400> 41
agtaatacga ctactatag gn

22

<210> 42
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (1)..(4)
<223> N = A, C, G OR T/U

<400> 42
nnncctata gtgagt

16

<210> 43

<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (1)..(5)
<223> N = A, C, G OR T/U

<400> 43
nnnnncctat agtgagt

17

<210> 44
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (21)..(22)
<223> N = A, C, G OR T/U

<400> 44
gtaatacgac tcactatagg nn

22

<210> 45
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (21)..(23)
<223> N = A, C, G OR T/U

<400> 45
gtaatacgac tcactatagg nnn

23

<210> 46
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (21)..(24)
<223> N = A, C, G OR T/U

<400> 46
gtaatacgac tcactatagg nnnn

24

<210> 47
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<220>
<221> modified_base
<222> (21)..(25)
<223> N = A, C, G OR T/U

<400> 47
gtaatacgac tcactatagg nnnnn

25

<210> 48
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 48
cgaggcgggt ggatcatgag gt

22

<210> 49
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 49
tctgtcgccc aggccggact

20

<210> 50
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

Primer

<400> 50
ccccccccc gtaatacgac tcactata 28

<210> 51
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 51
ccccccccc ccccgtaat acgactcact ata 33

<210> 52
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 52
ccccccccc ccccccccc gtaatacgac tcactata 38

<210> 53
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 53
ccccccccc 10

<210> 54
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 54
ccccccccc cccc 15

<210> 55
<211> 20
<212> DNA

<213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <400> 55
 cccccccccc cccccccccc 20
 <210> 56
 <211> 21
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <400> 56
 cccagaaacc ctgagaccct c 21
 <210> 57
 <211> 21
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <400> 57
 tgtgccacaa gttaagatgc t 21
 <210> 58
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <400> 58
 tgctgtatcg tgccctgctca at 22
 <210> 59
 <211> 21
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <400> 59
 tgccccactc cccaacattc t 21

<210> 60
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 60
aacagagcct cagggaccag t 21

<210> 61
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 61
gggctttgtc tgtggttggt a 21

<210> 62
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 62
tgggctggct gaggtcaaga t 21

<210> 63
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 63
ttttgctcgc ctgacatttg g 21

<210> 64
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 64
tgctcctgtc ccttccactt c 21

<210> 65
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 65
ccttattccc agcagcagta ttc 23

<210> 66
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 66
tgggaaggga aagagggtac t 21

<210> 67
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 67
ttgctgtaga tgggctttcg t 21

<210> 68
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 68
tctgctgggt tgatgatttg g 21

<210> 69
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 69
 ggcacaagca aaaggggtgtc t 21

<210> 70
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 70
 ccagcaatca ggaaagcaca a 21

<210> 71
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 71
 cacctgtctt gttggcatca cc 22

<210> 72
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 72
 ttgttttgcc tcaccagtca ttt 23

<210> 73
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 73
 tcagcaaacc caaagatggt a 21

<210> 74
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 74
ttagtccttt gggcagcacg a

21

<210> 75
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 75
tgtctctgct tctgaaacgg g

21

<210> 76
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 76
actgccaggg tcattgactt

20

<210> 77
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 77
taagcagcaa ggtctggg

18

<210> 78
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 78
 gtgattgaac aatttgacc cac 23

<210> 79
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 79
 atggcaacat tccacctagt agc 23

<210> 80
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 80
 ctccgcatg ataagatgca gt 22

<210> 81
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 81
 actgtttggg gtgtgaaagg ac 22

<210> 82
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 82
 actaacaacg ccctttgctc 20

<210> 83
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 83
 tcagcactcc gtatcttcat ttg 23

<210> 84
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 84
 taaaccgcta aaacgatagc agc 23

<210> 85
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 85
 tcatggtatt agggaagtgg gag 23

<210> 86
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 86
 gggaatgaaa agaaaaggca ttc 23

<210> 87
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 87
 tctttccctc tacaaccctc taacc 25

<210> 88

<211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 88
 cagtacatgg gtcttatgag tac 23

 <210> 89
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 89
 aatcgagaac gcacagagca ga 22

 <210> 90
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 90
 gtctggggag taaatgcaac atc 23

 <210> 91
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 91
 ttcttgatga ccctgcacaa 20

 <210> 92
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 92

cagcagaagc actaccaaag aca

23

<210> 93

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 93

ttcacctaga tggaatagcc acc

23

<210> 94

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 94

gcaagatttt tgcttggtc tat

23

<210> 95

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 95

gaattttggt ttcttgcttt gg

22

<210> 96

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 96

gtcagaagac tgaaaacgaa gcc

23

<210> 97

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 97
catctcttga tcatcccagc tct

23

<210> 98
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 98
caccattggt tgatagcaag gtt

23

<210> 99
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 99
taaacatagc accaaggggc

20

<210> 100
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 100
tcatgtgtgg gtcactaagg atg

23

<210> 101
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 101
cgtctctccc agctaggatg

20

<210> 102
<211> 24

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 102
 ctttttcaca gaactggtgt cagg 24

 <210> 103
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 103
 acccagcttt cagtgaagga 20

 <210> 104
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 104
 aatcaaaaagg ccaacagtgg 20

 <210> 105
 <211> 18
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 105
 actggctgag ggagcatg 18

 <210> 106
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 106
 taaatgtaac ccccttgagc c 21

<210> 107
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 107
tattgaccac atgaccccct 20

<210> 108
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 108
ttgggtgatg tcttcacatg g 21

<210> 109
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 109
gctcaataaaa aatagtagc cc 22

<210> 110
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 110
ttctcccagc tttgagacgt 20

<210> 111
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

Primer

<400> 111
tttgttactt gctaccctga g 21

<210> 112
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 112
gaagatgaag tgaactccta tcc 23

<210> 113
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 113
gaagccttga taacgagagt gg 22

<210> 114
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 114
atgtttctct ggccccaag 19

<210> 115
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 115
tggctgccct tcaatac 17

<210> 116
<211> 20
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 116

ttgggaaatg tcagtgaacca

20

<210> 117

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 117

tgtggtagg atagcacaag catt

24

<210> 118

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 118

tgcaatttga aggtacgagt ag

22

<210> 119

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 119

tgtaacaat ttgcataaca aaagc

25

<210> 120

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 120

gcattttctg tcccacaaga tatg

24

<210> 121
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 121
attgctgtca cagcaccttg 20

<210> 122
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 122
gcatatccat atctcccga t 21

<210> 123
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 123
cagagcactc cagaccatac g 21

<210> 124
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 124
cttcgttatg acccctgctc c 21

<210> 125
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 125
 tccaagatg aatggtaaga cg 22

<210> 126
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 126
 tccaatctca tcggtttact g 21

<210> 127
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 127
 tccagagccc agtaaacaac a 21

<210> 128
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 128
 ttacttcagc ccacatgctt c 21

<210> 129
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 129
 ttccgacata gcgactttgt ag 22

<210> 130
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 130
 aaggatcaga gatacccccac gg 22.

 <210> 131
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 131
 tccaagaacc aactaagtcc aga 23

 <210> 132
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 132
 ctaagggcaa acatagggat caa 23

 <210> 133
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 133
 caacctttga agccactttg ac 22

 <210> 134
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 134
 gcctccgtca ttggtatttt ct 22

<210> 135
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 135
tggcaacacg gtgctgacct g

21

<210> 136
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 136
atcatggggtt tggcagtaaa gc

22

<210> 137
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 137
agaaccagca aacccagtcc c

21

<210> 138
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 138
gaaaggggtgg atggattgaa a

21

<210> 139
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 139
tcagatttcc tggctccgct t 21

<210> 140
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 140
ccttctgctt ccctgtgacc t 21

<210> 141
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 141
tgaacccac gaggtgacag t 21

<210> 142
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 142
gacattacca gcccctcacc ta 22

<210> 143
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 143
tccttgacag ttccattcac ca 22

<210> 144
<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 144

tttgcaggta gctctaggtc a

21

<210> 145

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 145

gcggacagag agtaacctcg ga

22